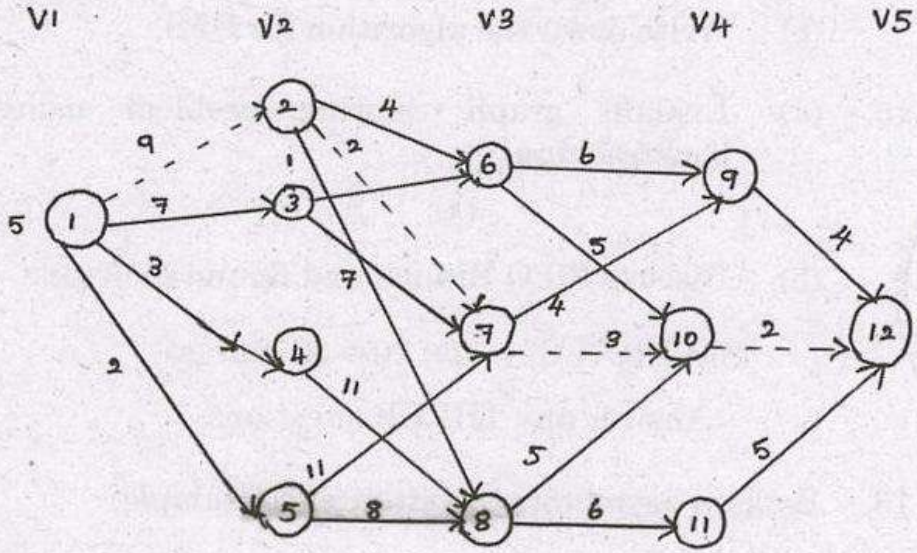
19. Find the minimum cost path from S to t for the given graph.



20. Demonstrate FIFO Branch and Bound with suitable example.

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NOVEMBER/DECEMBER 2025

FCA53/FCS53/CCA53/CCS53 — DESIGN AND ANALYSIS OF ALGORITHM

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

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1. Define Data structure.
2. List the applications of Stacks.
3. What is meant by optimal solution?
4. Define a binary search tree.
5. What is the use of container loading?
6. What is minimum spanning tree?
7. Define biconnectivity.
8. What do you mean by articulation point?
9. Define sum of subsets.
10. What is Hamiltonian cycle?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) List out the basic operations that can be performed on a queue with example.

Or

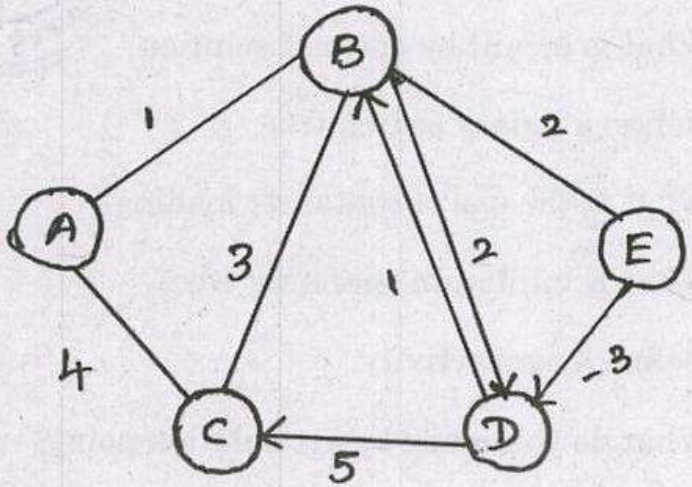
(b) Give an account time complexity.

12. (a) Derive the time complexity of quick sort.

Or

(b) Write down the algorithm for selection sort.

13. (a) Compute the shortest paths from a single source vertex to all the other vertices in a given weighted digraph.



Or

(b) Give an account on optimal storage on tapes.

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14. (a) Discuss about string editing.

Or

(b) Write down the algorithm for DFS.

15. (a) Explain graph coloring problem using backtracking.

Or

(b) Discuss FIFO Branch and Bound in detail.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain asymptotic notation with example.

17. How merge sort works? Explain.

18. Find the shortest path for the following graph using Dijkstra algorithm